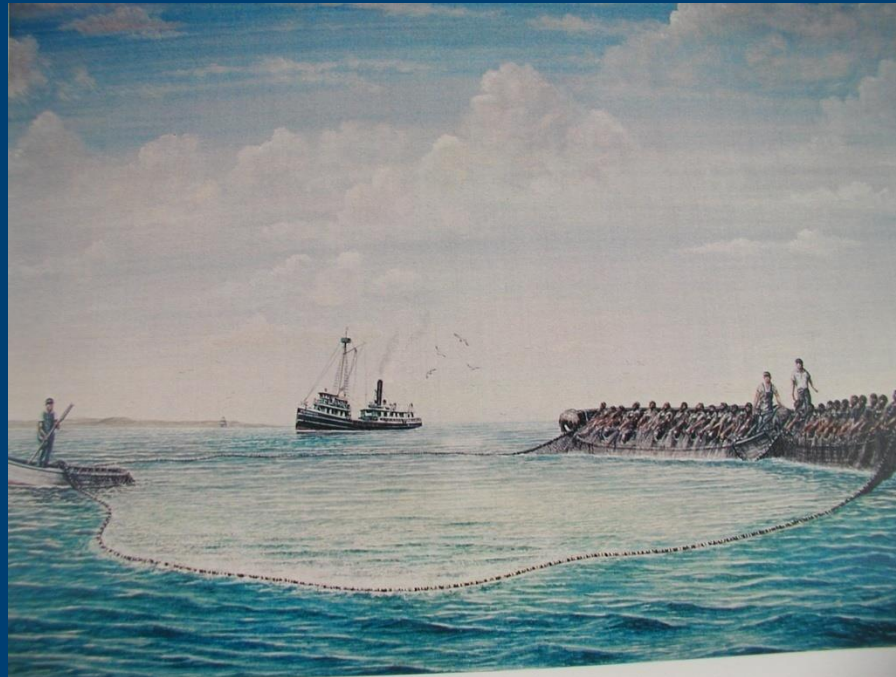


Menhaden Purse-Seine Fisheries



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SEFSC Program Reviews – June 2013

**NOAA
FISHERIES
SERVICE**



Atlantic and Gulf Menhaden



Scientific name: Atlantic menhaden, *Brevoortia tyrannus* (Family: Clupeidae)
Gulf menhaden, *B. patronus*

Distribution: Atlantic menhaden - ubiquitous from northern Florida to Gulf of Maine
Center of distribution: Chesapeake Bay
Gulf menhaden – Florida through Texas
Center of distribution: Mississippi and Louisiana

Salinity tolerance: Euryhaline

Life History: Obligate filter-feeder, estuarine-dependent, marine migratory

Schooling behavior: forms dense, near-surface schools warmer months of the year

Prey for numerous coastal fishes, sea birds, and marine mammals

Schools are targets of a large industrial purse-seine fishery
and a smaller purse-seine bait fishery



Menhaden Schooling

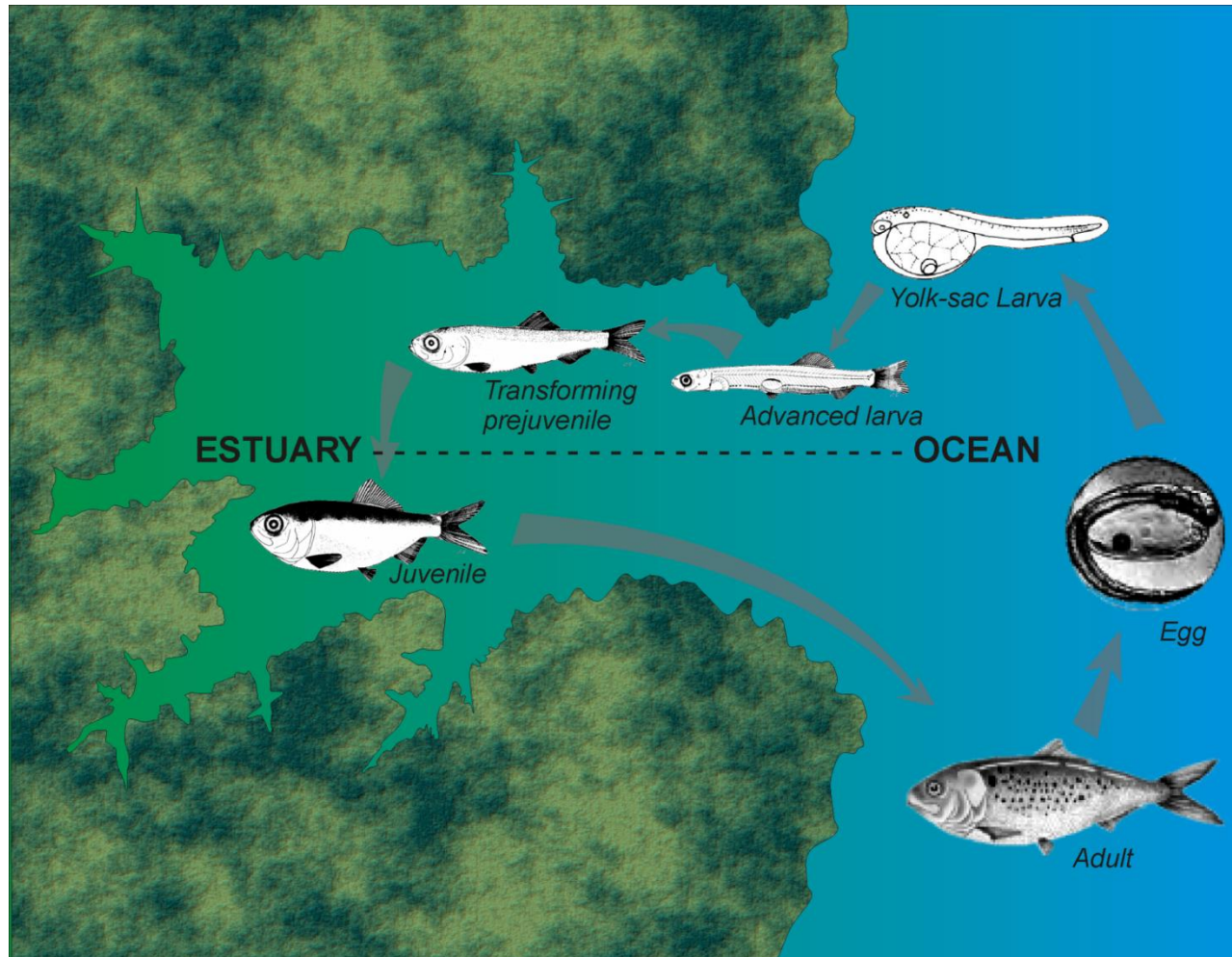
- Obligate filter-feeders
- Juveniles most efficient filtering phytoplankton and some zooplankton
- Adults most efficient filtering larger particles; tend toward filtering more zooplankton



Important energy pathway from primary producers to predatory fishes, sea birds, and marine mammals

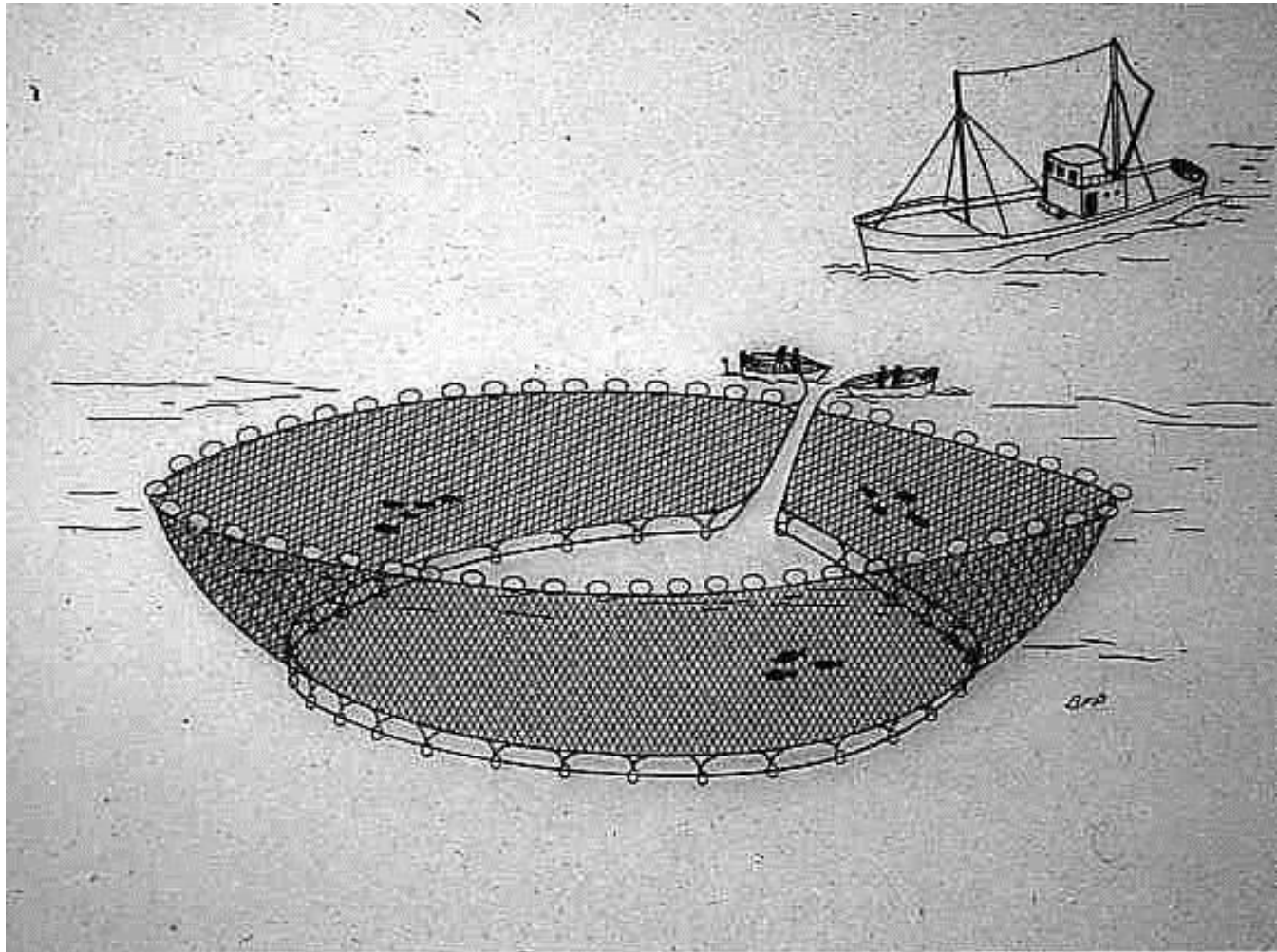


Generalized Menhaden Life Cycle





The Reduction Purse-Seine Fishery





Current fleet:

**About 8 purse-seine vessels on Atlantic coast,
about 35 vessels on the Gulf coast;
range ~175-200 ft long (53-61 m)**





**Each steamer carries two purse boats,
30-40 ft long (9-12 m)**





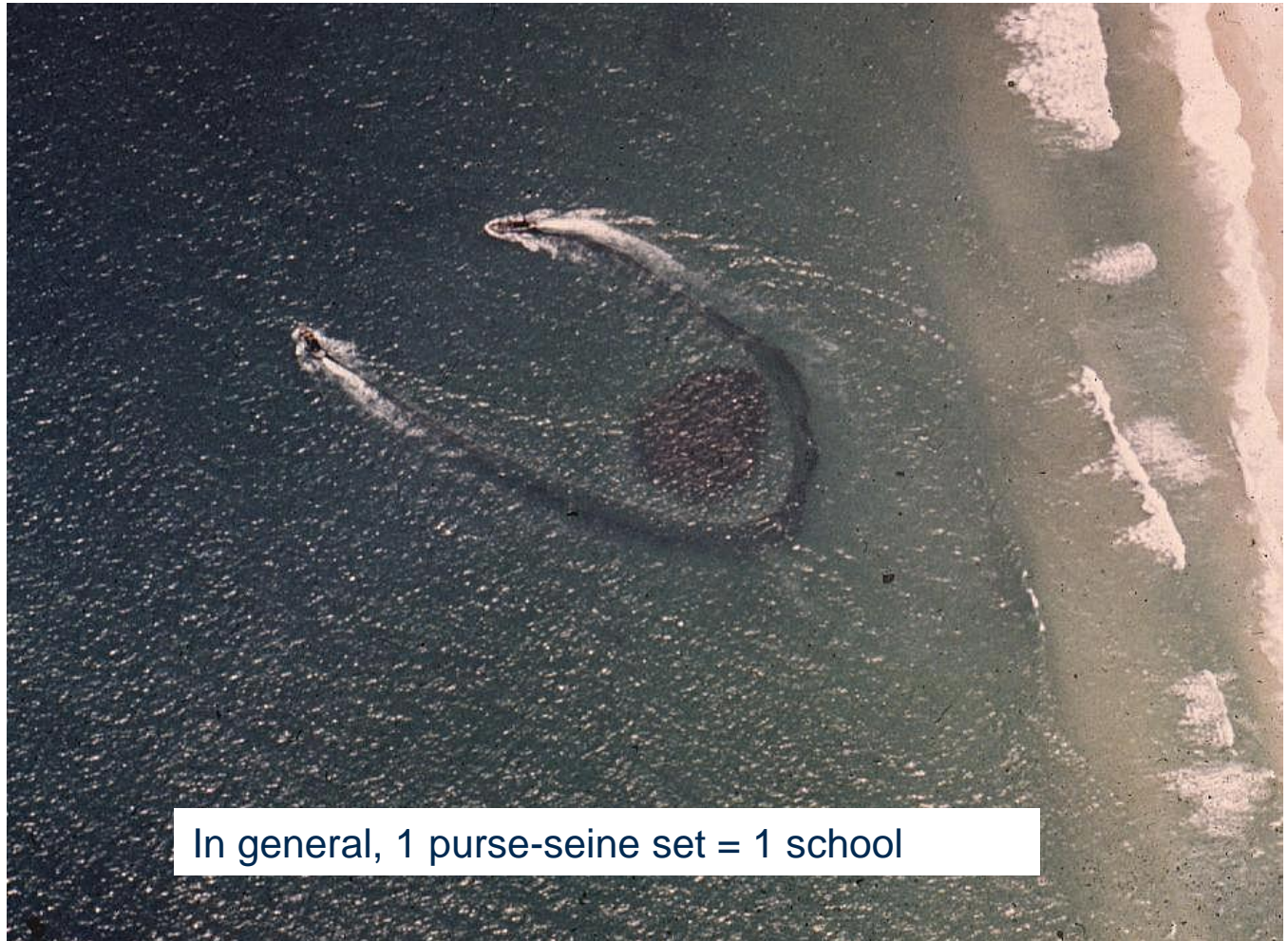
Schools generally located by spotter pilots





A 'Coastal' Fishery

Most sets within 3 miles (~5 km) of shore



In general, 1 purse-seine set = 1 school



‘Webbing’ wings of net into the purse boats

**Fishery operates
Monday through
Friday**

**May - Dec on
Atlantic;
Apr - Oct on Gulf**

**Median sets
per fishing day
~ 4-5**

**Median set size
about 20 metric
tons**



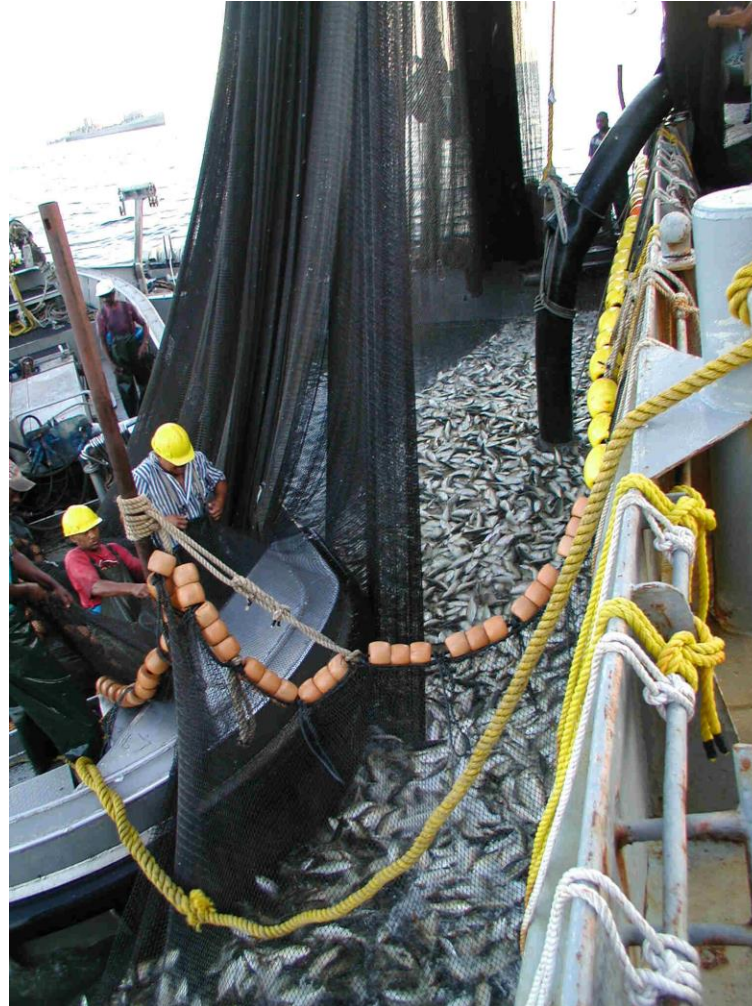


'Steamer' alongside of 'bunt' of net with catch



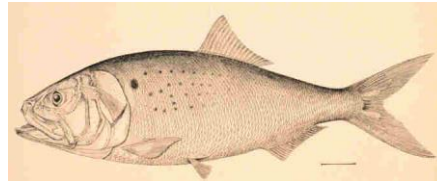


Pumping catch aboard 'steamer'

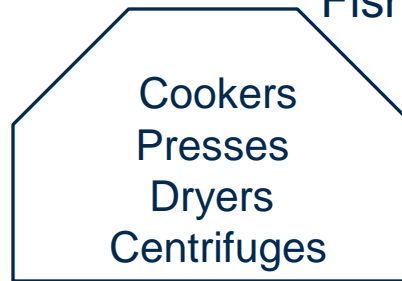




Processed Products



Fish factory



Fish meal



Poultry feed
Swine feed
Aquaculture feed
Pet feed



Fish oil



Feed ingredient

Edible oils
(omega-3's)



Fish solubles



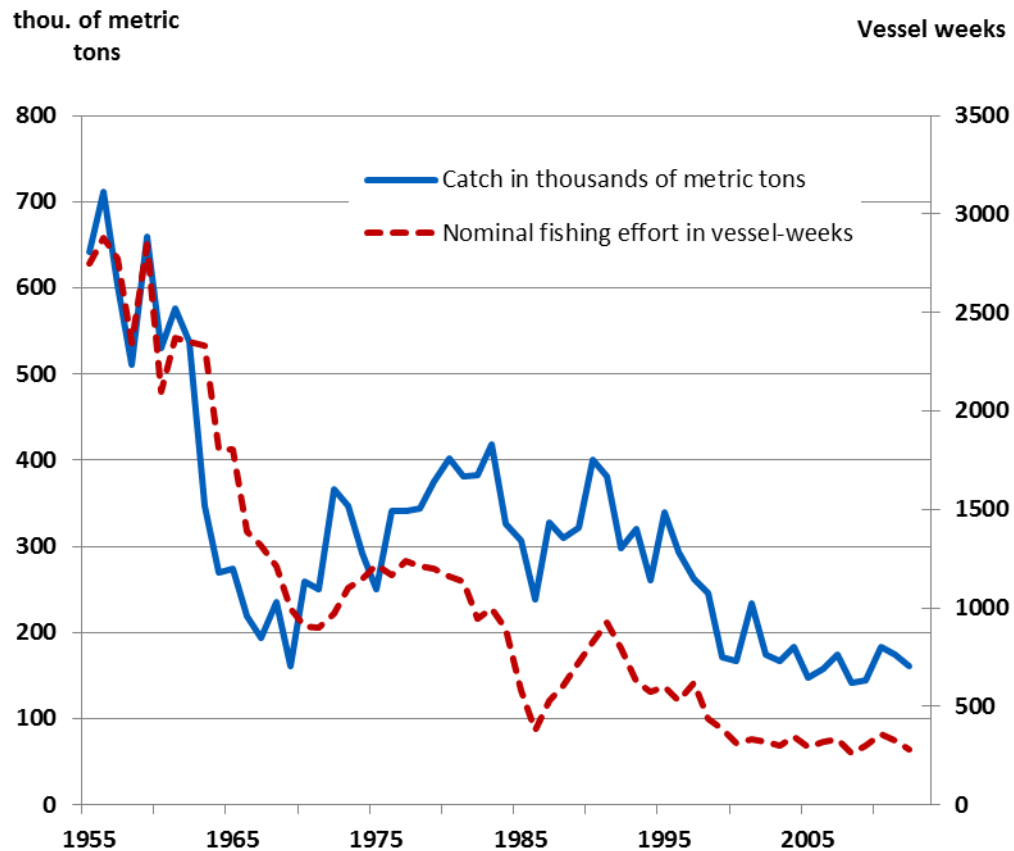
Feed additive

Enriched meal





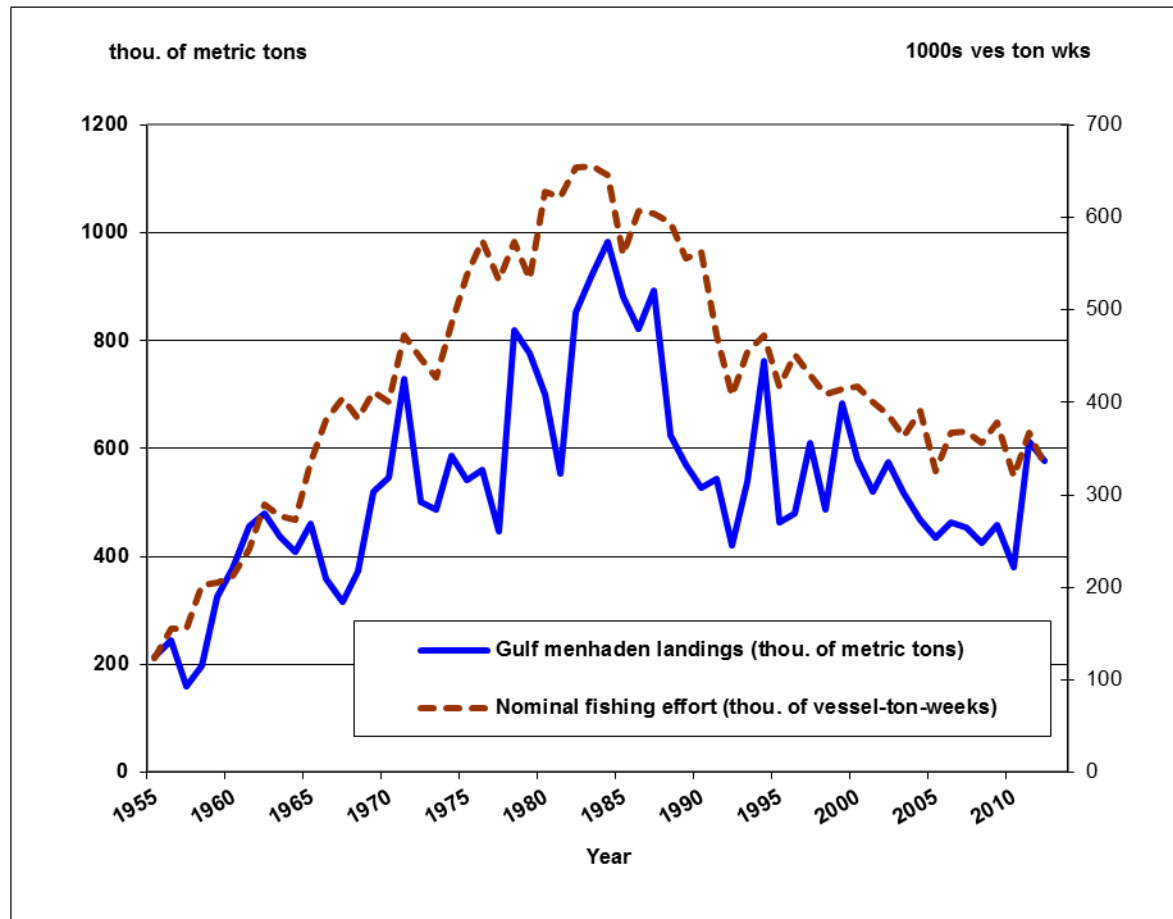
Historical Landings of Atlantic Menhaden



Vessel-week is one vessel fishing at least one day of a given week



Historical Landings of Gulf Menhaden



Vessel-ton-week is one vessel fishing at least one day of a given week times its net tonnage



Fishery-dependent data collection efforts
for the menhaden fisheries
have resided at the NMFS Beaufort Laboratory since 1955

1. **Port sampling** data for age and size composition of the catch
 - Protocols virtually unchanged
 - Atlantic: 1955-2012
 - Gulf: 1964-2012
2. **Landings data** for catch and effort (Catch records)
 - Atlantic: ~1940-2012
 - Gulf: ~1946-2012
3. Logbook data, or **Captains Daily Fishing Reports (CDFRs)**
 - Atlantic: 1985-2012
 - Gulf: 1983-2012



Port Samples: Last set of day assumed to be on top of the fish hold





Port samples acquired from top of the fish hold
with date and location of last purse-seine set





Ten fish randomly chosen from sample





Ten fish processed for:

- Fork length (mm)
- Weight (g)
- Scale patch for ageing

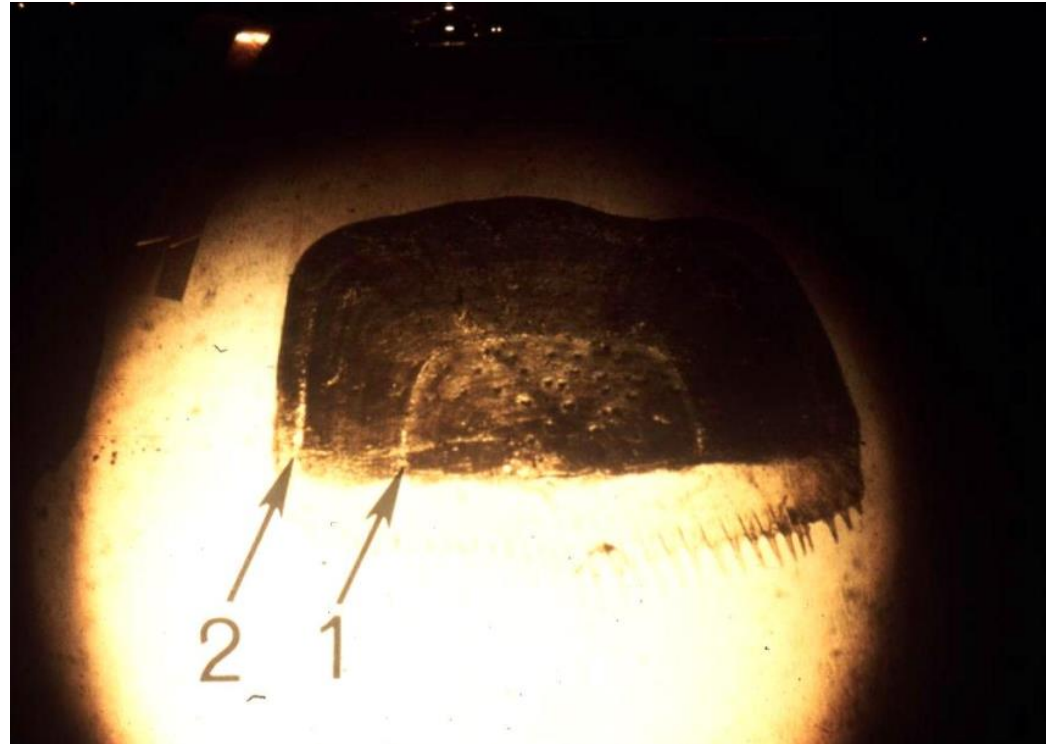




Menhaden are aged with scales

Mean number of menhaden aged
in recent years (2010-2012):

- Atlantic: 2,615 fish
- Gulf: 6,390 fish





Landings data are acquired from fish companies

- Landings are daily vessel unloads,
and in industry jargon “thousands of standard fish”
- One hopper dump = 1,000 standard fish, or
- One hopper dump = 670 lb or 0.3039 metric tons





Captains Daily Fishing Reports (CDFRs)

- Daily logbooks of fishing activity
- Enumerate set location, date and catch
- 100% vessel compliance
- >20,000 set records per year both coasts combined

CAPTAIN'S DAILY FISHING REPORT

Net Number 30309

NAME OF VESSEL <u>WILLARD P. LEBEOUF</u>					PLANT <u>Moss Point</u>		DATE <u>2/21/05</u> month day year	
IF VESSEL DID NOT LEAVE THE DOCK ON THIS FISHING DAY, CHECK HERE <input type="checkbox"/>					IF VESSEL LEFT THE DOCK AND DID NOT MAKE ANY SETS ON THE FISHING GROUNDS THIS FISHING DAY, CHECK HERE <input type="checkbox"/>			

SET NO.	TIME (Military)		FISH (000)	PLANE NO.	CDFR 5-DIGIT CODE	FISHING LOCATION		MILES TO SHORE	WEATHER CONDITIONS
	START	END				GPS (dd ° , mm' , ss ")			
						LATITUDE	LONGITUDE		
1	0645	0720	75	0	55-371	29° 41' 28.2"	89° 21' 84.6"	4 N	3-87-8-1
2	0950	1020	35	92	55-328	29° 25' 57.9"	89° 23' 35.2"	8 N	3-89-8-1
3	1355	1420	40	0	55-322	29° 38' 9.2"	89° 24' 28.8"	5 N	3-89-4-3
4	1440	1510	25	0	55-322	29° 39' 23.3"	89° 24' 84.2"	5 N	3-89-4-3
5	1615	1710	150	95	55-377	29° 42' 22.3"	89° 18' 9.32"	8 N	3-89-4-3
6	1815	1850	40	0	55-377	29° 41' 9.60"	89° 17' 6.86"	7 N	3-89-4-3
7									
8									
9									
10									
11									
12									

PUMP OUT	COMMENTS	 CAPTAIN'S SIGNATURE
	DATE / TIME RETURN TO DOCK _____	



Port sampling data and catch records merged and a catch-at-age matrix constructed on a plant-week level:

- Serve as input data for menhaden stock assessments
- Port-week level allows for considerably more precision than is typical for most stock assessments



Bait Purse-Seine Fishery for Atlantic Menhaden in Chesapeake Bay

**Sampled for size and age
composition of the catch**

Catches tracked via CDFRs



4-5 smaller vessels, ~100 ft long (33 m)

Catch used for crab and lobster bait



Assessment scientists at NMFS Beaufort Laboratory serve as leads for menhaden stock assessments:

- Benchmark Atlantic menhaden assessments are on a six-year cycle with updates on the third intervening year
- Benchmark gulf menhaden assessments are on roughly a five-year cycle

